

INTERNATIONAL SEARCH REPORT

International Application No

PCT/US2004/034932

A. CLASSIFICATION OF SUBJECT MATTER
 IPC 7 C12N15/867 C12N5/10 C12N15/11

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 C12N

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data, PAJ, BIOSIS, EMBASE

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	RUBINSON DOUGLAS A ET AL: "A lentivirus-based system to functionally silence genes in primary mammalian cells, stem cells and transgenic mice by RNA interference." NATURE GENETICS, vol. 33, no. 3, March 2003 (2003-03), pages 401-406, XP002973404 ISSN: 1061-4036 figures 1a,b Y page 404, right-hand column, paragraph 2 ----- -/-	1,2,4-6, 10
		7,9, 11-15, 18-21

Further documents are listed in the continuation of box C

Patent family members are listed in annex.

* Special categories of cited documents .

- "A" document defining the general state of the art which is not considered to be of particular relevance
- "E" earlier document but published on or after the international filing date
- "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- "O" document referring to an oral disclosure, use, exhibition or other means
- "P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance, the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"8" document member of the same patent family

Date of the actual completion of the international search

Date of mailing of the international search report

4 April 2005

19/04/2005

Name and mailing address of the ISA

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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No
X	DEVROE E & SILVER P A: "Retrovirus-delivered siRNA" BMC TECHNOLOGY, BIOMED CENTRAL, LONDON, GB, 28 August 2002 (2002-08-28), pages 1-5, XP002225637 ISSN: 1472-6750 figures 1,3 page 4, right-hand column - page 5, left-hand column -----	1,2,4-6, 8,10,16, 17,22
X	TISCORNIA GUSTAVO ET AL: "A general method for gene knockdown in mice by using lentiviral vectors expressing small interfering RNA." PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA. 18 FEB 2003, vol. 100, no. 4, 18 February 2003 (2003-02-18), pages 1844-1848, XP002321924 ISSN: 0027-8424 page 1845, left-hand column, paragraph 4 -----	2
Y	MITTA BARBARA ET AL: "Advanced modular self-inactivating lentiviral expression vectors for multigene interventions in mammalian cells and in vivo transduction." NUCLEIC ACIDS RESEARCH. 1 NOV 2002, vol. 30, no. 21, 1 November 2002 (2002-11-01), pages E113.1-E113.18, XP002321925 ISSN: 1362-4962 figure 1 -----	9,11-15, 18-21
Y	LIEBERMAN J ET AL: "Interfering with disease: opportunities and roadblocks to harnessing RNA interference" TRENDS IN MOLECULAR MEDICINE, XX, XX, vol. 9, no. 9, September 2003 (2003-09), pages 397-403, XP002976675 page 398, right-hand column, paragraph 4 -----	7
A	BRUMMELKAMP T R ET AL: "STABLE SUPPRESSION OF TUMORIGENICITY BY VIRUS-MEDIATED RNA INTERFERENCE" CANCER CELL, XX, US, vol. 2, no. 3, September 2002 (2002-09), pages 243-247, XP009006464 ISSN: 1535-6108 figure 1 ----- -/-	1-22

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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No
A	DIRAC ANNETTE M G ET AL: "Reversal of senescence in mouse fibroblasts through lentiviral suppression of p53." JOURNAL OF BIOLOGICAL CHEMISTRY, vol. 278, no. 14, 4 April 2003 (2003-04-04), pages 11731-11734, XP002321846 ISSN: 0021-9258 figure 1 -----	1-22
A	QIN XIAO-FENG ET AL: "Inhibiting HIV-1 infection in human T cells by lentiviral-mediated delivery of small interfering RNA against CCR5." PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA, vol. 100, no. 1, 7 January 2003 (2003-01-07), pages 183-188, XP002975768 ISSN: 0027-8424 page 183, right-hand column, last paragraph -----	1-22
A	MCMANUS M T ET AL: "Gene silencing in mammals by small interfering RNAs" NATURE REVIEWS GENETICS, MACMILLAN MAGAZINES, GB, vol. 3, October 2002 (2002-10), pages 737-747, XP002973403 the whole document -----	1-22
A	SHI Y: "Mammalian RNAi for the masses" TRENDS IN GENETICS, ELSEVIER, AMSTERDAM, NL, vol. 19, no. 1, January 2003 (2003-01), pages 9-12, XP004398851 ISSN: 0168-9525 the whole document -----	1-22
A	WO 03/079757 A (MASSACHUSETTS INSTITUTE OF TECHNOLOGY; THE CENTER FOR BLOOD RESEARCH,) 2 October 2003 (2003-10-02) the whole document -----	1-22
P, X	WO 2004/022722 A (MASSACHUSETTS INSTITUTE OF TECHNOLOGY; BEAR, JAMES, E; DILLON, CHRISTO) 18 March 2004 (2004-03-18) examples 1-7 figure 17 -----	1, 2, 4-6, 10 -----
		-/-

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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No
P,X	LIU X-D ET AL: "Short hairpin RNA and retroviral vector-mediated silencing of p53 in mammalian cells" BIOCHEMICAL AND BIOPHYSICAL RESEARCH COMMUNICATIONS, ACADEMIC PRESS INC. ORLANDO, FL, US, vol. 324, no. 4, 12 October 2004 (2004-10-12), pages 1173-1178, XP004609139 ISSN: 0006-291X figure 1 -----	1,2,4-6, 10

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Box II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. Claims Nos.: because they relate to subject matter not required to be searched by this Authority, namely:

2. Claims Nos.: because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:

3. Claims Nos.: because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6 4(a).

Box III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.

2. As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.

3. As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:

4. No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

The additional search fees were accompanied by the applicant's protest.
 No protest accompanied the payment of additional search fees.

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FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

Invention 1: claims 1-8,10,16,22 (all partially); claims 17-21 (all complete)

Relating to Murine Stem Cell virus (MSCV) based retroviral vectors comprising a U6 promoter, a polylinker and a nucleic acid encoding a short hairpin RNA (shRNA) and cells transduced by said vector.

Invention 2: claims 1-7,9,10 (all partially); claims 11-15 (all complete)

Relating to lentivirus based vectors comprising a U6 promoter, a polylinker and a nucleic acid encoding a short hairpin RNA (shRNA) and cells transduced by said vector.

Invention 3: claims 1-10, 22 (all partially)

Relating to retroviral vectors comprising an H1 promoter, a polylinker and a nucleic acid encoding a short hairpin RNA (shRNA) and cells transduced by said vectors.

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Patent document cited in search report	Publication date	Patent family member(s)			Publication date
WO 03079757	A 02-10-2003	AU 2003224725 A1	CA 2479530 A1	EP 1495141 A2	08-10-2003
				WO 03079757 A2	02-10-2003
			US 2004248296 A1		12-01-2005
WO 2004022722	A 18-03-2004	AU 2003268546 A1	WO 2004022722 A2		29-03-2004
					18-03-2004

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